



Format No: CP/TF/01

## TEST REPORT ON COARSE AGGREGATES

Lab ID : CP-2020-01-07-25 Date: 11-11-19  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 08-11-19  
Sample Type : 40mm down size coarse aggregate  
Reference to BIS codes : IS: 383:2016 (Specification for Coarse and fine Aggregates)  
IS: 2386 :1963(Part - 1,3,4) RA2011  
IS 2386 Part 1: Particle Size and Shape  
IS 2386 Part 3: Specific gravity, Density, Voids, Water Absorption  
IS 2386 Part 4: Mechanical Properties  
Date of test : 08-11-19

### SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|------------|-----------|------------------------|-----------------------------------|------------------------------|-----------|-----------------------------|
| 1          | 80 mm     | 0                      | 0                                 | 0.0                          | 100       | 100                         |
| 2          | 40 mm     | 214                    | 214                               | 1.4                          | 98.6      | 90-100                      |
| 3          | 20 mm     | 7254                   | 7468                              | 49.8                         | 50.2      | 30-70                       |
| 4          | 10 mm     | 4442                   | 11910                             | 79.4                         | 20.6      | 10-35                       |
| 5          | 4.75 mm   | 2685                   | 14595                             | 97.3                         | 2.7       | 0-5                         |
| 6          | Pan       | 405                    | 15000                             | 100.0                        | 0         | ---                         |

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## TEST REPORT ON COARSE AGGREGATES

Lab ID : CP-2020-01-07-25 Date: 11-11-19  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads  
Agency : and Surrounding Areas in Ward No. 02  
Customer Reference : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main  
Date of Receipt : Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Sample Type/ Size : BBMP/EE/TNK.D/W.O/175/2019-20  
Reference to BIS codes : 08-11-19  
20mm down size coarse aggregate  
IS: 383:2016 (Specification for Coarse and fine Aggregates)  
IS: 2386 :1963(Part - 1,3,4) RA2011  
IS 2386 Part 1: Particle Size and Shape  
IS 2386 Part 3: Specific gravity, Density, Voids, Water Absorption  
IS 2386 Part 4: Mechanical Properties  
Date of test : 08-11-19

### SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|------------|-----------|------------------------|-----------------------------------|------------------------------|-----------|-----------------------------|
| 1          | 40 mm     | 0                      | 0                                 | 0                            | 100       | 100                         |
| 2          | 20 mm     | 237                    | 237                               | 4.7                          | 95.3      | 90-100                      |
| 3          | 10 mm     | 2544                   | 2781                              | 55.6                         | 44.4      | 25-55                       |
| 4          | 4.75 mm   | 2107                   | 4888                              | 97.8                         | 2.2       | 0-10                        |
| 5          | Pan       | 112                    | 5000                              | 100                          | 0         | -                           |

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## TEST REPORT OF FINE AGGREGATE

Format No: CP/TF/01

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 08-11-19  
Sample Type : Fine Aggregate  
Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)  
IS: 2386 : 1963 (Part - 1, 3) RA2012  
IS 2386 Part 1: Particle Size and Shape  
IS 2386 Part 3: Specific gravity, Density, Voids, Water Absorption  
Date of test : 08-11-19

Total weight taken : 1000 grams

| Sl.no | Sieve Size | Weight Retained (gms) | Cumulative Weight Retained (gms) | % Cumulative Weight Retained | % Passing | Requirement as per IS 383:2016 |                 |                  |                 |
|-------|------------|-----------------------|----------------------------------|------------------------------|-----------|--------------------------------|-----------------|------------------|-----------------|
|       |            |                       |                                  |                              |           | Grading Zone I                 | Grading Zone II | Grading Zone III | Grading Zone IV |
| 1     | 10 mm      | 0                     | 0                                | 0.0                          | 100.0     | 100                            | 100             | 100              | 100             |
| 2     | 4.75 mm    | 26                    | 26                               | 2.6                          | 97.4      | 90-100                         | 90-100          | 90-100           | 95-100          |
| 3     | 2.36 mm    | 51                    | 77                               | 7.7                          | 92.3      | 60-95                          | 75-100          | 85-100           | 95-100          |
| 4     | 1.18 mm    | 238                   | 315                              | 31.5                         | 68.5      | 30-70                          | 55-90           | 75-100           | 90-100          |
| 5     | 600 micron | 201                   | 516                              | 51.6                         | 48.4      | 15-34                          | 35-59           | 60-79            | 80-100          |
| 6     | 300 micron | 204                   | 720                              | 72.0                         | 28.0      | 5-20                           | 8-30            | 12-40            | 15-50           |
| 7     | 150 micron | 192                   | 912                              | 91.2                         | 8.8       | 0-10                           | 0-10            | 0-10             | 0-15            |
| 8     | Pan        | 88                    | 1000                             | 100.0                        | 0.0       | ---                            | ---             | ---              | ---             |

Result : The tested Sample Conforms to Grading Zone II

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## TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 18-11-19  
Customer ID : Drain Bottom Slab Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 16/11/2019

| Sl. No. | Identification Mark        | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen      | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |
|---------|----------------------------|-------------------|-----------------|-----------------|--------------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|
|         |                            |                   |                 |                 | (mm)                           | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |
| 1       | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 151.92 X<br>149.82 X<br>149.63 | 22761                | 8.624                | 429.7        | 18.9                 | 18.6                         |
| 2       | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.71 X<br>149.70 X<br>151.86 | 22411                | 8.078                | 417.1        | 18.6                 |                              |
| 3       | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 150.26 X<br>150.69 X<br>151.68 | 22643                | 8.995                | 414.9        | 18.3                 |                              |

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## TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 18-11-19  
Customer ID : Drain Bottom Slab Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 16/11/2019

| Sl. No. | Identification Mark        | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |
|---------|----------------------------|-------------------|-----------------|-----------------|---------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|
|         |                            |                   |                 |                 | (mm)                      | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |
| 1       | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.47 X                  | 22649                | 8.624                | 426.3        | 18.8                 | 18.9                         |
|         |                            |                   |                 |                 | 151.53 X                  |                      |                      |              |                      |                              |
|         |                            |                   |                 |                 | 149.22                    |                      |                      |              |                      |                              |
| 2       | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.94 X                  | 22629                | 8.078                | 424.4        | 18.8                 |                              |
|         |                            |                   |                 |                 | 150.92 X                  |                      |                      |              |                      |                              |
|         |                            |                   |                 |                 | 151.90                    |                      |                      |              |                      |                              |
| 3       | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.88 X                  | 22672                | 8.995                | 430.6        | 19.0                 |                              |
|         |                            |                   |                 |                 | 151.26 X                  |                      |                      |              |                      |                              |
|         |                            |                   |                 |                 | 151.74                    |                      |                      |              |                      |                              |

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## TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 23-11-19  
Customer ID : Drain Side Wall Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 28/11/2019

| SL No. | Identification Mark      | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen<br>(mm) | Cross sectional area<br>(Sq.mm) | Weight of the sample<br>(kg) | Failure Load<br>(KN) | Compressive strength<br>(N/mm <sup>2</sup> ) | Average Compressive Strength<br>(N/mm <sup>2</sup> ) |
|--------|--------------------------|-------------------|-----------------|-----------------|-----------------------------------|---------------------------------|------------------------------|----------------------|----------------------------------------------|------------------------------------------------------|
| 1      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 151.39 X<br>150.54 X<br>149.82    | 22791                           | 8.624                        | 410.9                | 18.0                                         | 18.2                                                 |
| 2      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 149.15 X<br>150.64 X<br>151.00    | 22468                           | 8.078                        | 413.2                | 18.4                                         |                                                      |
| 3      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 151.47 X<br>149.60 X<br>149.85    | 22659                           | 8.995                        | 413.5                | 18.2                                         |                                                      |

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## TEST REPORT OF CEMENT CONCRETE CUBES

Format No: CP/TF/01

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 23-11-19  
Customer ID : Drain Side Wall Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 28/11/2019

| SL No. | Identification Mark      | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen (mm) | Cross sectional area (Sq.mm) | Weight of the sample (kg) | Failure Load (KN) | Compressive strength (N/mm <sup>2</sup> ) | Average Compressive Strength (N/mm <sup>2</sup> ) |
|--------|--------------------------|-------------------|-----------------|-----------------|--------------------------------|------------------------------|---------------------------|-------------------|-------------------------------------------|---------------------------------------------------|
| 1      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 149.83 X<br>151.10 X<br>149.93 | 22640                        | 8.624                     | 421.6             | 18.6                                      | 18.5                                              |
| 2      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 150.87 X<br>149.37 X<br>150.82 | 22535                        | 8.078                     | 414.2             | 18.4                                      |                                                   |
| 3      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 150.87 X<br>150.80 X<br>150.71 | 22751                        | 8.995                     | 422.7             | 18.6                                      |                                                   |

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**TEST REPORT OF CEMENT CONCRETE CUBES**

Lab ID : CP-2020-01-07-25 Date: 28/11/2019

Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02

Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010

Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20

Date of Receipt : 23-11-19

Customer ID : Drain Side Wall Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 28/11/2019

| SL No. | Identification Mark      | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |
|--------|--------------------------|-------------------|-----------------|-----------------|---------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|
|        |                          |                   |                 |                 | (mm)                      | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |
| 1      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 149.43 X                  | 22412                | 8.624                | 420.0        | 18.7                 | 18.7                         |
|        |                          |                   |                 |                 | 149.99 X                  |                      |                      |              |                      |                              |
|        |                          |                   |                 |                 | 149.52                    |                      |                      |              |                      |                              |
| 2      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 150.91 X                  | 22565                | 8.078                | 419.1        | 18.6                 |                              |
|        |                          |                   |                 |                 | 149.53 X                  |                      |                      |              |                      |                              |
|        |                          |                   |                 |                 | 149.40                    |                      |                      |              |                      |                              |
| 3      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 150.13 X                  | 22605                | 8.995                | 425.6        | 18.8                 |                              |
|        |                          |                   |                 |                 | 150.57 X                  |                      |                      |              |                      |                              |
|        |                          |                   |                 |                 | 150.87                    |                      |                      |              |                      |                              |

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FOR CIVIL Pro.  
R. KARTHIK RECHAN  
Authorized Signatory  
Quality Manager



M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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## TEST REPORT OF CEMENT CONCRETE CUBES

Format No: CP/TF/01

Date: 28/11/2019

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 23-11-19  
Customer ID : Drain Side Wall Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 28/11/2019

| SL No. | Identification Mark      | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen<br>(mm) | Cross sectional area<br>(Sq.mm) | Weight of the sample<br>(kg) | Failure Load<br>(KN) | Compressive strength<br>(N/mm <sup>2</sup> ) | Average Compressive Strength<br>(N/mm <sup>2</sup> ) |
|--------|--------------------------|-------------------|-----------------|-----------------|-----------------------------------|---------------------------------|------------------------------|----------------------|----------------------------------------------|------------------------------------------------------|
| 1      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 151.96 X<br>149.87 X<br>152.00    | 22773                           | 8.624                        | 415.9                | 18.3                                         | 18.3                                                 |
| 2      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 151.45 X<br>151.21 X<br>149.79    | 22901                           | 8.078                        | 419.5                | 18.3                                         |                                                      |
| 3      | Drain Side Wall Concrete | M20               | 21/11/2019      | 28/11/2019      | 149.77 X<br>149.90 X<br>149.51    | 22451                           | 8.995                        | 413.1                | 18.4                                         |                                                      |

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*R. Karthik Rechan*

**R KARTHIK RECHAN**  
Authorized Signatory  
Quality Manager



M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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## TEST RESULTS OF GRADATION FOR GSB (IS 2386:(Part 1) 1963 (RA2011))

Lab ID : CP-RW-2020-01-07-25 Date: 21-11-19  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s. Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer Reference : BBMP/EE/YNK.D/W.O/175/2019-20  
Date of Receipt : 19-11-19  
Type of Mix : GSB (Granular Sub Base)  
Date of test : 19-11-19  
Oven Dry Weight : 10000 Grams

| IS Sieve Size(mm) | Weight Retained (gm) | Cumulative Weight Retained (gm) | % Cumulative Weight Retained | % Passing | Spec. Limit Vide Table 400.1 MORTH Specification |
|-------------------|----------------------|---------------------------------|------------------------------|-----------|--------------------------------------------------|
| 75                | 0                    | 0                               | 0                            | 100       | 100                                              |
| 53                | 997                  | 997                             | 9.97                         | 90.03     | 80-100                                           |
| 26.5              | 1685                 | 2682                            | 26.82                        | 73.18     | 55-90                                            |
| 9.5               | 1292                 | 3974                            | 39.74                        | 60.26     | 35-65                                            |
| 4.75              | 1490                 | 5464                            | 54.64                        | 45.36     | 25-55                                            |
| 2.36              | 1764                 | 7228                            | 72.28                        | 27.72     | 20-40                                            |
| 0.425             | 1666                 | 8894                            | 88.94                        | 11.06     | 10-25                                            |
| 0.075             | 1106                 | 10000                           | 100.00                       | 0.00      | 0-5                                              |

### TESTS ON FILLER SCREEN MATERIALS

| Sl no | Particulars         | Test results | Spec. Limit Vide Table |
|-------|---------------------|--------------|------------------------|
| 1     | Liquid Limit, %     | 21.33%       | Maximum 25             |
| 2     | Plasticity index, % | Non plastic  | Maximum 6              |

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## PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID : CP-RW-2020-01-07-25 Date: 09-12-19  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s. Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Banagalore: 560010  
Customer Reference : BBMP/EE/YNK.D/W.O/175/2019-20  
Date of Receipt : 06-12-19  
Type of Mix : DBM (Dense Bituminous Macadam)  
Date of test : 06-12-19

Table 500-6 : Physical Requirements for Coarse Aggregate for Dense Bituminous Macadam

| Property         | Test                   | Result | Specification                                                | Method of Test   |
|------------------|------------------------|--------|--------------------------------------------------------------|------------------|
| Partical Shape   | Flakiness Index        | 13.0   | Combined Flakiness & Elongation Index for DBM is Maximum 35% | IS:2386 Part I   |
|                  | Elongation Index       | 12.0   |                                                              |                  |
| Strength         | Aggregate Impact Value | 20.0   | Maximum 30%                                                  | IS:2386 Part IV  |
| Specific gravity | Specific gravity       | 2.58   | Maximum 2.7                                                  | IS:2386 Part III |
| Water Absorption | Water Absorption       | 0.38   | Maximum 2%                                                   | IS:2386 Part III |

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## TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID : CP-RW-2020-01-07-25 Date: 09-12-19  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s.Technical Manager (West) KRIDL,Bangaluru,5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Banagalore:560010  
Customer Reference : BBMP/EE/YNK.D/W.O/175/2019-20  
Date of Receipt : 06-12-19  
Type of Mix : DBM(Dense Bitumnous Macadam)  
Date of test : 06-12-19  
Type of Binder :  
% of Binder Used : 60/70  
Weight of Aggregate : 5.0%  
Weight of Binder : 200.0 gm  
Temperature of water bath : 10.0 gm  
40°C

| No of test | Retained Stripping Percentage | Stripping Percentage | Average Retained Stripping Percentage | Secified limits as per MORTH specification table 500-8 |
|------------|-------------------------------|----------------------|---------------------------------------|--------------------------------------------------------|
| 1          | 98.0                          | 2.0                  | 98.2                                  | Minimum Retained Coating 95%                           |
| 2          | 98.5                          | 1.5                  |                                       |                                                        |
| 3          | 98.0                          | 2.0                  |                                       |                                                        |

*Accepted A.E. 02*

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*R. Karthik Rechan*  
R KARTHIK RECHAN  
Authorized Signatory  
Quality Manager



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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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**TESTS RESULTS ON STABILITY OF MIX**

**Lab ID** : CP-RW-2020-01-07-25 **Date:** 16-12-19  
**Project Name** : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
**Agency** : M/s. Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Banagalore: 560010  
**Customer Reference** : BBMP/EE/YNK.D/W.O/175/2019-20  
**Date of Receipt** : 12-12-19  
**Type of Mix** : BC (Bituminous Concrete)  
**Date of test** : 12-12-19

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

| Sl.No | Particulars of observations               | TEST 1 | TEST 2 | Secified limits as per MORTH specification table 500-11 |
|-------|-------------------------------------------|--------|--------|---------------------------------------------------------|
| 1     | Marshal Stability at 60°C, KN             | 11.14  | 11.13  | 10KN(min)                                               |
| 2     | Marshal flow at 60°C, mm                  | 3.52   | 3.51   | 2-4                                                     |
| 3     | Percent air Voids                         | 4.82   | 4.83   | 3-5                                                     |
| 4     | Percent Voids in mineral Aggregate(VMA %) | 14.28  | 14.26  | 13-15                                                   |
| 5     | Percent Voids filled with Bitumen(VFB %)  | 71.87  | 71.63  | 65-75                                                   |
| 6     | Density, g/cc                             | 2.25   | 2.26   | -                                                       |

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**TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade**

Lab ID : CP-2020-01-07-25 Date: 11-11-19

Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02

Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010

Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20

Date of Receipt : 08-11-19

Sample Type : Birla Super 53 grade

Reference to BIS codes : IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,  
IS 4031 (Part 1, 2, 3, 4, 5, 6, 11): 1988  
IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4  
IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5  
IS 4031 Part 3, Determination of Soundness, Clause 5, Clause 6  
IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5  
IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5  
IS 4031 Part 11, DETERMINATION OF DENSITY, Clause 6

Date of test : 09-11-19

Environmental Conditions during test : Temperature: 26°C  
Humidity: 72%

| SL.No. | Physical properties                                           | Results     | Requirement as per IS 12269: 2013 |
|--------|---------------------------------------------------------------|-------------|-----------------------------------|
| 1      | Fineness by dry sieving (%)                                   | 2.1         | —                                 |
| 2      | Fineness by Air permeability method (m <sup>2</sup> /kg, Min) | 284.5       | 225m <sup>2</sup> /kg, Min        |
| 3      | Density (gm/cc)                                               | 3.13        | —                                 |
| 4      | Standard Consistency (%)                                      | 28%         | Not specified                     |
| 5      | Initial Setting time                                          | 180 minutes | Not less than 30 minutes          |
| 6      | Final Setting time                                            | 260 minutes | Not more than 600 minutes         |
| 7      | Soundness (Le Chatelier's Method)                             | 1mm         | Not more than 10 mm               |

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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## TEST REPORT OF PRECAST COVER SLAB

Lab ID : CP-2020-01-07-25 Date: 02-12-19  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 28-11-19  
Sample Type /Size : Precast Cover Slab (100mm)  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete  
Date of test : 28/11/2019

| SL No. | Identification Mark | Diameter of the core | Height of the core | Weight of the core | Area    | Failure Load | Core Compressive strength | Corrected Cylinder Compressive strength | Equivalent Cube Compressive strength |
|--------|---------------------|----------------------|--------------------|--------------------|---------|--------------|---------------------------|-----------------------------------------|--------------------------------------|
|        |                     | (mm)                 | (mm)               | (kg)               | (Sq.mm) | (KN)         | (N/mm <sup>2</sup> )      | (N/mm <sup>2</sup> )                    | (N/mm <sup>2</sup> )                 |
| 1      | Cover Slab-1        | 75.51                | 100.48             | 1.116              | 4477    | 80.9         | 18.1                      | 16.8                                    | 21.0                                 |
| 2      | Cover Slab-2        | 75.49                | 100.52             | 1.122              | 4475    | 82.3         | 18.4                      | 17.1                                    | 21.4                                 |
| 3      | Cover Slab-3        | 75.50                | 100.51             | 1.118              | 4476    | 81.5         | 18.2                      | 16.9                                    | 21.2                                 |

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## TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2020-01-07-25 Date: 16/11/2019  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 18-11-19  
Customer ID : Drain Bottom Slab Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5  
Date of test : 16/11/2019

| SL No. | Identification Mark        | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen      | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |
|--------|----------------------------|-------------------|-----------------|-----------------|--------------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|
|        |                            |                   |                 |                 | (mm)                           | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |
| 1      | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.77 X<br>151.93 X<br>150.79 | 22754                | 8.624                | 414.3        | 18.2                 | 18.4                         |
| 2      | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 151.57 X<br>150.68 X<br>149.51 | 22839                | 8.078                | 431.3        | 18.9                 |                              |
| 3      | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 150.49 X<br>150.98 X<br>150.35 | 22721                | 8.995                | 412.1        | 18.1                 |                              |

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## TEST REPORT OF CEMENT CONCRETE CUBES

Date: 16/11/2019

Lab ID : CP-2020-01-07-25  
 Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
 Agency : M/s Technical Manager (West) KRIDL, Bangaluru, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
 Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
 Date of Receipt : 18-11-19  
 Customer ID : Drain Bottom Slab Concrete  
 Sample Type /Size : 150X150X150 mm  
 Sample grade/Age : M20 / 7 Days Compressive Strength  
 Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete C15

Date of test : 16/11/2019

| Date of test |                            |                   |                 |                 | :                         | 16/11/2019           |                      |              |                      |                              |  |
|--------------|----------------------------|-------------------|-----------------|-----------------|---------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|--|
| SL No.       | Identification Mark        | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |  |
|              |                            |                   |                 |                 | (mm)                      | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |  |
| 1            | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.73 X                  | 22526                | 8.624                | 422.5        | 18.8                 | 18.7                         |  |
|              |                            |                   |                 |                 | 150.44 X                  |                      |                      |              |                      |                              |  |
|              |                            |                   |                 |                 | 150.32                    |                      |                      |              |                      |                              |  |
| 2            | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 151.96 X                  | 22997                | 8.078                | 436.5        | 19.0                 |                              |  |
|              |                            |                   |                 |                 | 151.34 X                  |                      |                      |              |                      |                              |  |
|              |                            |                   |                 |                 | 151.35                    |                      |                      |              |                      |                              |  |
| 3            | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 151.67 X                  | 22835                | 8.995                | 421.1        | 18.4                 |                              |  |
|              |                            |                   |                 |                 | 150.55 X                  |                      |                      |              |                      |                              |  |
|              |                            |                   |                 |                 | 151.37                    |                      |                      |              |                      |                              |  |

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 Authorized Signatory  
 Quality Manager

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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## TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2020-01-07-25  
Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02  
Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010  
Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20  
Date of Receipt : 18-11-19  
Customer ID : Drain Bottom Slab Concrete  
Sample Type /Size : 150X150X150 mm  
Sample grade/Age : M20 / 7 Days Compressive Strength  
Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl 5  
Date of test : 16/11/2019

| SL No. | Identification Mark        | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen      | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |
|--------|----------------------------|-------------------|-----------------|-----------------|--------------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|
|        |                            |                   |                 |                 | (mm)                           | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |
| 1      | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.82 X<br>151.71 X<br>151.50 | 22729                | 8.624                | 430.1        | 18.9                 | 18.6                         |
| 2      | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 150.65 X<br>150.04 X<br>151.26 | 22603                | 8.078                | 409.9        | 18.1                 |                              |
| 3      | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 23/11/2019      | 149.39 X<br>150.40 X<br>150.34 | 22468                | 8.995                | 418.9        | 18.6                 |                              |

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**A.E.E**

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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## TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2020-01-07-25 Date: 14/12/2019

Project Name : Improvements to Roads and Drains at JP colony Main and Cross Roads and Surrounding Areas in Ward No. 02

Agency : M/s Technical Manager (West) KRIDL, Bangalore, 5th Block 17th Main Shivakumar Swamy Building, Bhashyam Circle Bangalore: 560010

Customer's Reference : BBMP/EE/TNK.D/W.O/175/2019-20

Date of Receipt : 18-11-19

Customer ID : Drain Bottom Slab Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 14/12/2019

| Date of Test: 14/12/2019 |                            |                   |                 |                 |                           |                      |                      |              |                      |                              |
|--------------------------|----------------------------|-------------------|-----------------|-----------------|---------------------------|----------------------|----------------------|--------------|----------------------|------------------------------|
| SL No.                   | Identification Mark        | Grade of concrete | Date of Casting | Date of Testing | Dimension of the Specimen | Cross sectional area | Weight of the sample | Failure Load | Compressive strength | Average Compressive Strength |
|                          |                            |                   |                 |                 | (mm)                      | (Sq.mm)              | (kg)                 | (KN)         | (N/mm <sup>2</sup> ) | (N/mm <sup>2</sup> )         |
| 1                        | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 14/12/2019      | 151.43 X                  | 22702                | 8.552                | 535.9        | 23.6                 | 23.5                         |
|                          |                            |                   |                 |                 | 149.92 X                  |                      |                      |              |                      |                              |
|                          |                            |                   |                 |                 | 151.11                    |                      |                      |              |                      |                              |
| 2                        | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 14/12/2019      | 150.40 X                  | 22654                | 8.882                | 520.1        | 23.0                 |                              |
|                          |                            |                   |                 |                 | 150.63 X                  |                      |                      |              |                      |                              |
|                          |                            |                   |                 |                 | 151.34                    |                      |                      |              |                      |                              |
| 3                        | Drain Bottom Slab Concrete | M20               | 16/11/2019      | 14/12/2019      | 149.26 X                  | 22658                | 8.732                | 539.6        | 23.8                 |                              |
|                          |                            |                   |                 |                 | 151.81 X                  |                      |                      |              |                      |                              |
|                          |                            |                   |                 |                 | 149.15                    |                      |                      |              |                      |                              |

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KARTHIK RECHAN  
Authorized Signatory  
Quality Manager

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A.E.E

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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